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SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/578,980 12/27/95 KAMAKURA

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WILLE, EXAMINER

BSM1/0911

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ART UNIT PAPER NUMBER

2508

5

DATE MAILED: 09/11/96

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☐ Responsive to communication filed on \_\_\_\_\_ ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), \_\_\_\_\_ days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

**Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:**

- |   |  |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input checked="" type="checkbox"/> Notice of Draftsman's Patent Drawing Review, PTO-948. |
| 3. <input type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449.                 | 4. <input type="checkbox"/> Notice of Informal Patent Application, PTO-152.                  |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474.     | 6. <input type="checkbox"/> _____  |

**Part II SUMMARY OF ACTION**

1. ☒ Claims 1-7 are pending in the application.

Of the above, claims \_\_\_\_\_ are withdrawn from consideration.

2. ☐ Claims \_\_\_\_\_ have been cancelled.

3. ☐ Claims \_\_\_\_\_ are allowed.

4. ☒ Claims 1-7 are rejected.

5. ☐ Claims \_\_\_\_\_ are objected to.

6. ☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on \_\_\_\_\_. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on \_\_\_\_\_, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed \_\_\_\_\_, has been ☐ approved; ☐ disapproved (see explanation).

12. ☒ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☒ been received ☐ not been received ☐ been filed in parent application, serial no. \_\_\_\_\_; filed on \_\_\_\_\_.

13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

**EXAMINER'S ACTION**

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## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. Claims 1 through 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The disclosure refers to “...dense defect-injected region...”. The terminology is not defined and does not correspond to standard condensed matter terminology. In addition, the phrase “... being made of material being more fragile than the hetero-configuration.” is not defined and does not correspond to standard condensed matter terminology.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. In so far as the claims are understood, claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Scifres et al.

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Scifres et al describe a double hetero-structure LED which uses a strain layer to prevent defect migration to the active region. In addition, the hetero-junction employs an undoped layer between two cladding layers.

*Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. In so far as it is understood, claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scifres et al in view of Inoue et al.

Scifres et al teach the use of a strain layer to prevent defect migration and discuss the use of a buffer layer, which is known to also limit defect migration. Inoue teaches the use of multiple defect regions to limit defect migration and it would have been obvious to one skilled in the art at the time of the invention to include a second strain layer to supplement the buffer region.

6. In so far as they are understood, claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scifres et al in view of Sugawara et al.

Scifres et al describe a double hetero-structure LED. Sugawara et al discuss an LED structure which specifically calls out a current spreading layer and details the use of a buffer layer. It would

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have been obvious to one skilled in the art at the time of the invention to include the current spreading layer and the details of the buffer layer.

7. In so far as it is understood, claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scifres et al in view of Sugawara et al.

Scifres et al describe a double hetero-junction LED with clad layers enclosing an undoped region and having a strain layer to prevent defect migration. Sugawara et al provide details of a buffer region, a current spreading region and a reflective layer. It would have been obvious to one skilled in the art at the time of the invention to include the current spreading layer, the details of the buffer layer, and the reflective layers.

8. In so far as it is understood, claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scifres et al in view of Sugawara et al, and further in view of Inoue et al.

Scifres et al describe a double hetero-junction LED with clad layers enclosing an undoped region and having a strain layer to prevent defect migration. Sugawara et al provide details of a buffer region, a current spreading region and a reflective layer. Inoue et al describe the use of multiple defect controlling layers. It would have been obvious to one skilled in the art at the time of the invention to include the current spreading layer, the details of the buffer layer, the reflective layers and a second layer to prevent defect migration.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A. Wille whose telephone number is (703) 308-4949.

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DAW

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